Purpose
This lab is an application of arrays (2 dimensional).

Description
Write a program that first prints a menu. The menu should contain the options to perform the following 3x3 - matrix operations.

1. Determinant
2. Transpose
3. Addition
4. Subtraction
5. Multiplication
6. Exit

The user chooses what option to perform and enters the input matrix (matrices) to get the required output. (Here this program is written for 3x3 matrix of floating-point values).

The output consists of the given input matrices and output matrix for each case. To exit from the program option 6 should be used. If we enter an option other than the above 6 options, it will ask you to enter correct option.

Functions to be used in the program

1. matrix_read( float a[3][3] ) : To read a matrix
2. matrix_display( float a[3][3] ) : To display a matrix
3. matrix_det(float a[3][3] ) : To find the determinant of a 3x3 matrix
4. matrix_trans(float a[3][3] ) : To find the transpose of a given 3x3 matrix
5. matrix_add(float a[3][3], float b[3][3] ) : To find the sum of two 3x3 matrices.
6. matrix_sub(float a[3][3], float b[3][3] ) : To find the difference of two 3x3 matrices.
7. matrix_mult(float a[3][3], float b[3][3] ) : To find the product of two 3x3 matrices
<Matrix Sizes>

Addition, subtraction, and transposition will work with MxN matrices up to and including 4x4 matrices.

Determinants should be calculated for square matrices of size 3x3 only.

Multiplication should work for matrices of size 4x4 or smaller – including an MxN matrix times an NxP matrix.

For matrices outside of the above boundaries appropriate error messages should be printed.

<Instructions to be followed>
1. Create new directory – Lab10
2. Change your working directory to Lab10
3. Create a new file named Lab10.cpp and open it
4. Add header banner to your code
5. Add sufficient comments
6. Indent your code
7. Submit the program using submission program only

<Sample Run>

Main menu
************************
1. Determinant
2. Transpose
3. Addition
4. Subtraction
5. Multiplication
6. Exit
************************
Select your choice: 1
Enter the elements of the Array a
a [1][1] = 2
a [1][2] = 3
a [1][3] = 4
a [2][1] = 3
a [2][2] = 2
a [2][3] = 3
a [3][1] = 2
a [3][2] = 3
a [3][3] = 2
The elements of the Array a

2 3 4
3 2 3
2 3 2
The determinant value is : 10

Main menu
********************
1. Determinant
2. Transpose
3. Addition
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5. Multiplication
6. Exit
----------------------
Select your choice : 2
Enter the elements of the Array a
a [1][1] = 3
a [1][2] = 4
a [1][3] = 5
a [2][1] = 6
a [2][2] = 3
a [2][3] = 4
a [3][1] = 1
a [3][2] = 9
a [3][3] = 7
The array a :

3 4 5
6 3 4
1 9 7
The transpose of the array a :

3 6 1
4 3 9
Main menu
****************
1. Determinant
2. Transpose
3. Addition
4. Subtraction
5. Multiplication
6. Exit
-------------------
Select your choice : 3
Enter the elements of the Array a
a [1][1] = 2
a [1][2] = 4
a [1][3] = 5
a [2][1] = 6
a [2][2] = 7
a [2][3] = 4
a [3][1] = 5
a [3][2] = 44
a [3][3] = 3
Enter the elements of the Array b
b [1][1] = 4
b [1][2] = 5
b [1][3] = 4
b [2][1] = 3
b [2][2] = 3
b [2][3] = 5
b [3][1] = 6
b [3][2] = 2
b [3][3] = 3

The elements of the Array a

2  4  5
6  7  4
5  44  3

The elements of the Array b
The elements of the Array c

6 9 9
9 10 9
11 46 6

Main menu
********************
1. Determinant
2. Transpose
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5. Multiplication
6. Exit
-------------------
Select your choice : 4
Enter the elements of the Array a
a[1][1] = 3
a[1][2] = 4
a[1][3] = 3
a[2][1] = 3
a[2][2] = 4
a[2][3] = 5
a[3][1] = 6
a[3][2] = 7
a[3][3] = 8
Enter the elements of the Array b
b[1][1] = 1
b[1][2] = 2
b[1][3] = 9
b[2][1] = 6
b[2][2] = 5
b[2][3] = 4
b[3][1] = 3
b[3][2] = 7
b [3][3] = 4

The elements of the Array a

3 4 3
3 4 5
6 7 8

The elements of the Array b

1 2 9
6 5 4

3 7 4

The elements of the Array c

2 2 -6
-3 -1 1
3 0 4

Main menu
********************
1. Determinant
2. Transpose
3. Addition
4. Subtraction
5. Multiplication
6. Exit
--------------------
Select your choice : 5
Enter the elements of the Array a
a [1][1] = 2
a [1][2] = 6
a [1][3] = 2
a [2][1] = 4
Enter the elements of the Array b

b[1][1] = 5
b[1][2] = 6
b[1][3] = 7
b[2][1] = 4
b[2][2] = 3
b[2][3] = 4
b[3][1] = 5
b[3][2] = 9
b[3][3] = 0

The elements of the Array a

2 6 2
4 5 6
7 3 4

The elements of the Array b

5 6 7
4 3 4
5 9 0

The elements of the Array c

44 48 38
70 93 48
67 87 61

Main menu
********************
1. Determinant
2. Transpose
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-------------------
Select your choice : 6
Press any key to continue